

FISHERIES MANAGEMENT PLAN

for

Mountain Lakes in the Stillwater River Drainage

Montana

Patrick E. Marcuson (1980)  
Michiel D. Poore (1991)  
Department of Fish, Wildlife and Parks

## Introduction

### Absaroka-Beartooth Wilderness Lakes

The Absaroka-Beartooth Wilderness Area (A-B) established in 1978 encompasses 930,584 acres and contains more area over 10,000 feet in elevation than any other area in the U.S. It rates as one of the top four or five wilderness areas in the country, receiving about 320,000 visitor-days of use each year. For comparison, the Bob Marshall Wilderness area receives about 150,000 visitor-days use yearly. The Absarokee Beartooth Wilderness Area and lands immediately adjacent contain 948 high mountain lakes, 318 of which contain fish and 630 that are barren. Approximately 204 of these lakes have self-sustaining fisheries and 114 are stocked. Stocking schedules vary from early in some of the more heavily used areas to once every six to ten years in the lakes managed for trophy fisheries.

Pat Marcuson, during the time he worked for the Montana Department of Fish, Wildlife and Parks (MDFWP) out of Red Lodge, gathered a tremendous amount of information on the A-B lakes and created a massive data base. In 1980 he developed fisheries management plans for each major drainage. Since that time, a computer data base containing the latest information on the lakes with fisheries has also been developed. This data base is located at the MDFWP Regional Headquarters in Billings. Additional information about individual lakes can be obtained from that office.

The purpose of this document is to update the 1980 lake management plan with the latest fisheries information available for the mountain lakes in the Stillwater River Drainage.

## Methods

Mountain lake information is collected primarily by a lake survey team consisting of two temporary employees who spend about eight weeks backpacking into the remote lakes of the A-B mountains. Lakes scheduled for sampling are selected based on length of time since last survey, questions about the status of fish introductions, impending scheduled fish plants, and angler reports. Fish populations are monitored with lightweight experimental nylon gill nets, hook and line, and visual surveys. Additional information gathered includes lake access, pH, air and surface water temperatures, availability of firewood and campsites, and extent of recreation use. Observations are also made of aquatic invertebrates, cruising and rising fish, fish fry, and suitability of substrate for spawning. Inlet and outlet streams are visually surveyed for fish and spawning activity or potential.

Fish collected are weighted and measured, and scales are taken for later age determination. Live fish are released, dead fish are dissected to check for parasites and general health and condition; stomachs are examined for food organisms.

Spot creel checks are conducted by enforcement and fisheries personnel to determine catch rates and angler satisfaction with regulations. Additional angler use information was gathered during 1988 and 1989 with a voluntary trailhead creel information survey implemented at the major access points to the A-B wilderness area. The purpose of this survey was to address a proposed new three-fish limit, estimate harvest and catch rates, solicit public comments, and gather additional fisheries information. Supplemental fisheries information is also obtained from guides and outfitters, Wilderness Rangers and other Forest Service personnel, as well as reports from other Wilderness users.

Information gathered from all sources is summarized and analyzed to make fish management decisions for the mountain lakes. Regulations are adjusted as necessary to help achieve desired fish population levels. Stocking rates and individual lake management strategies are adjusted as necessary to maintain desired angler catch rates, fish growth rates, and species distribution. Summarized information is used to update the computer data base for each mountain lake sampled.

## DESCRIPTION

### Location and number of lakes

The Stillwater River is the largest drainage in the Beartooth Ranger District of the Custer National Forest (Figure 1). It drains 342.9 square miles of Forest and 324.2 square miles of private lands. The Forest has 151 lakes; 3 small lakes occur on private land for a total of 154 for the drainage (Table 1). All but 15 lakes in the drainage are within the Absaroka-Beartooth Wilderness Area. Some lakes which are known by more than one name are listed in a table at the end of this report.

Sixty-three lakes are in Park County, 48 in Stillwater, 42 in Sweet Grass and 1 is shared by Stillwater and Sweet Grass counties. All 154 lakes are in the Beartooth Mountain Range. Nye, Dean, Limestone, Fishtail and Absarokee are all towns within the drainage. Cooke City, Montana is closest to the southern end of the drainage.

### Lake areas and depths

Lake water covers 1,193.9 acres of the drainage; only 58.4 acres of lake water are outside Wilderness boundaries. Lakes range from 0.4 to 102 (Table 1), the largest being Goose Lake. The average size of these 154 lakes is 7.5 acres. Goose Lake is the only water exceeding 100 surface acres.

Only Courthouse Lake (205 feet) exceeds 200 feet of depth. Five lakes, including Goose - 130 feet, Barrier - 130 feet, Lightning - 122 feet, Lake Wilderness - 120 feet, and Wrong Lake - 116 feet, have depths between 100 and 200 feet. Eleven waters are between 50 and 100 feet deep, 44 are between 15 and 50, and the majority (93) are less than 15 feet deep (Marcuson 1968, 1970, 1971, 1972, 1974, 1975, 1976a).

### Lake elevations

The highest lakes in the drainage encompass Fox Peak near Goose Lake. The very highest is Unnamed #41a at 10,400 feet above sea level. The lowest lake is Turco Pond at 4,840 feet near Nye, Montana. Twenty-three lakes are just over 10,000 feet; 101 are between 9,000 and 10,000 feet; 22 are between 8,000 and 9,000 feet; and the remaining 7 are less than 8,000 feet. An overwhelming majority (93) of the lakes are associated with the Subalpine Zone, 29 occupy the Alpine Zone, 18 are in the Canadian, and 11 are located in the Transition Zone.

Stillwater River Drainage map

Stillwater drainage river map continued

Table 1. Summary of locations, physical features and fisheries information for lakes in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	County <sup>2</sup>	Forest <sup>3</sup>	Elevation in feet	Area in acres t=total	Maximum depth in feet	Shoal (% of lake less than 15 ft. deep)	Ecological zone <sup>4</sup>	Fish Species <sup>5</sup>	Fish population type <sup>6</sup>	Fish management <sup>7</sup>
LITTLE ROCKY CREEK											
1	Chrome	32	C	8,412	3.6	17	90	1	B		3
1a	Turco Pond	32	P	4,840	.4	3	100		B		3
1b	Little Rocky	32	C	9,200	2.9	14	100	3	B		3
WOODBINE CREEK											
2	Lake Wilderness	32	C	9,481	30.0	120	26	3	CT	1	1
3	Wood	32	C	9,690	11.9	38	19	3	CT	2	2
3a	Unnamed	32	C	9,855	1.7	4	100	3	B		3
3b	Unnamed	32	C	9,950	.7	5	100	3	B		3
4	Unnamed (5)	32	C	9,948	2.5t	4	100	3	B		3
5	Woodbine	32	C	9,092	7.6	68	27	3	B		1
6	Nightmare	32	C	9,140	3.5	35	33	1	B		1
STILLWATER RIVER											
7	Sioux Charley	32	C	5,630	3.6	3.5	100	1	EB	1	1
									CT	1	1
									RB	1	1
FALLS CREEK											
8	Cataract	32	C	8,751	9.7	45	26	3	CT	2	1
CORKSCREW CREEK											
9	Corkscrew	32	C	8,300	5.3	3	100	3	B		3

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10	Upper Corkscrew 3 ponds	32	C	9,150	5.3 1.1t	11	100 100	3 3	B B	1 3	
11	Unnamed	32	C	9,500	5.6	9	100	3	B		3
12	Unnamed	32	C	9,840	6.4	8	100	3	B		3
CLARKS CREEK											
13	Imelda	49	C	9,750	32.4	75	16	3	EB	1	1
14	Unnamed	49	C	10,360	1.6	3	100	4	B		3
15	Unnamed	49	C	10,060	1.8	3	100	4	B		3
15a	Unnamed	49	C	10,070	1.2	3	100	4	B		3
16	Unnamed	49	C	9,980	4.4	8	100	4	B		3
GLACIER CREEK											
17	Glacier Creek	49	C	8,920	16.3	47	20	3	EB	1	1
18	Incisor	49	C	9,640	5.9	32	46	3	GT	1	6
18a	Unnamed	49	C	9,950	.1	2	100	3	B		3
18b	Unnamed	49	C	9,590	.3	3	100	3	B		7
18c	Unnamed	49	C	9,280	.6	3	100	3	B		7
19	Cavity	49	C	10,050	9.9	92	15	4	B		1
19a	Unnamed	49	C	10,075	.7	4	100	4	B		3
20	Wrong	49	C	9,000	20.6	116	14	3	CT	2	5



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21	Courthouse	49	C	10,000	18.8	205	12	4	CT	2	2
22	Unnamed (3)	49	C	10,080	3.2t	8	100	4	B		3
23	Unnamed (3)	49	C	10,700	5.0t	6	100	4	B		3
SOURDOUGH CREEK											
24	Sourdough	49	C	9,520	2.6	22	35	3	EB	1	1
25	Fly	49	C	9,760	2.5	38	27	3	EB	1	1
26	Spider	49	C	9,750	6.3	61	21	3	EB	1	1
27	Unnamed (3)	49	C	9,990	1.9t	6	100	3	B		3
28	Unnamed (4)	49	C	10,120	.6t	2	100	3	B		3
29	Lake Aries	49	C	9,570	3.8	32	30	3	EB	1	1
30	Unnamed	49	C	9,650	1.6	3	100	3	B		3
31	Unnamed	49	C	9,900	3.6	10	100	3	B		3
32	Unnamed	49	C	10,382	2.8	20	52	3	B		1
33	Unnamed	49	C	9,900	1.4	6	100	3	B		3
BEAUTY CREEK											
34	Beauty	49	C	9,200	5.9	55	28	2	CT	1	1
35	Puddle	49	C	9,520	.4	6	100	3	B		3
GOOSE CREEK											
36	Anvil	49	C	9,440	10.1	45	49	3	CT	2	2

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37	Star Dust	49	C	9,580	2.1	5	100	3	B	3	
38	Panhandle	49	C	9,600	2.9	15	100	3	B	3	
39	Unnamed (3)	49	C	9,640	1.3t	8	100	3	B	3	
40	Wall	49	C	9,849	3.3	17	96	4	B	3	
41	Unnamed	49	C	10,190	7.4			4	B	3	
41a	Unnamed (5)	49	C	10,440	2.2t	3	100	4	B	3	
42	Goose	49	C	9,830	102.0	130	28	4	CT	1	1
43	Little Goose	49	C	9,835	8.1	23	64	4	CT	1	1
43a	Unnamed	49	C	9,838	1.6	7	100	4	CT	1	1
43b	Unnamed	49	C	9,840	.8	3	100	4	CT	1	1
44	Hilltop	49	C	9,840	1.1	14	100	3	B	3	
45	Unnamed	49	C	9,740	12.9	16	88	3	B	3	
45a	Unnamed	49	C	9,800	2.1	6	100	3	B	3	
46	Huckleberry	49	C	9,520	15.3	49	26	3	EB	1	1
47	Mutt	49	C	9,910	1.5	4	100	3	EB	1	1
48	Jeff	49	C	9,210	1.3	4	100	3	EB	1	1
HORSESHOE CREEK											
49	Lake of the Woods	49	C	8,675	7.9	16	81	2	CT	1	1

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WILD CAT CREEK											
50a	Wildcat	32	C	8,840	7.8	9	100	4	B	1	
50b	Wildcat	32	C	8,840	7.9	17	77	4	B	1	
SOUTH FORK WOUNDED MAN CREEK											
51	Unnamed	40	C	9,275	2.1	9	100	3	B	3	
52	Unnamed	40	C	9,275	4.1	4.5	100	3	B	3	
53	Unnamed	40	C	8,575	3.1	3	100	3	B	3	
54	Aufwuchs	40	C	8,895	30.0	28	46	2	CT	2	1
MIDDLE FORK WOUNDED MAN CREEK											
55	Mouse	40	C	9,650	6.9	30	42	3	CT	2	2
56	Favonius	40	C	9,410	25.5	15	100	3	H <sub>2</sub>	1	1
57	Unnamed	40	C	9,570	1.6	3	100	3	B	3	
58	Unnamed	40	C	9,740	4.0			3	B	3	
59	Pentad	40	C	9,362	40.7	58	21	3	H <sub>2</sub>	1	1
60	Unnamed	40	G	9,330	4.1			3	H <sub>2</sub>	1	1
61	Sundown	40	C	9,500	5.2			3	CT	2	
62	Jordan	40	C	8,790	14.7	35	27	1	CT	1	1
63	Cirque	40	C	8,800	6.1	15	100	2	B	1	

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64	Sunken Rock	40	C	9,250	11.1	30	43	3	GT	2	5
65	Martes	40	C	9,150	17.5	33	40	3	CT	2	2
NORTH FORK WOUNDED MAN CREEK											
66	Barrier	40	C	8,150	42.4	130	10	3	H <sub>1</sub>	1	1
67	Unnamed	40	C	9,170	2.4	4	100	3	B		3
68	Unnamed	40	C	9,475	2.6	5	100	3	H <sub>2</sub>	1	7
69	Unnamed	40	C	9,570	2.3	6	100	3	H <sub>2</sub>	1	7
70	Pipit	40	C	9,580	7.0	25	75	3	H <sub>2</sub>	1	1
71	Owl	40	C	9,541	14.4	30	75	3	H <sub>2</sub>	1	1
72	Wounded Man	40	C	9,248	50.2	55	70	3	RB	1	1
73	Lake Diaphanous	40	C	9,631	9.2	25	83	3	RB	1	1
STILLWATER RIVER											
74	Roosevelt	32	C	6,325	2.8	4	100	1	B		3
75	Sienna	32	C	9,290	11.0	84	23	3	B		1
FLOOD CREEK											
76	Bill	32	C	8,380	10.4	28	49	1	RB	1	1
									GT	1	1
									CT	1	1
									H	1	1

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77	Mini	32	C	8,430	1.4	8	100	2	RB GT CT H	1 1 1 1	1 1 1 1
78	Needle	32	C	9,130	2.3	4	100	2	B		7
79	Comet	32	C	9,280	6.3	47	28	3	B		7
80	Asteroid	32	C	9,380	3.2	40	40	3	GT	2	6
81	Lake Vengeance	32	C	9,880	1.5			3	B		3
82	Hermit	32	C	9,930	4.0			3	B		3
83	Lake Pisces	32	C	9,630	9.9	80	21	3	B		1
84	Dryad	32	C	9,090	5.1	45	60	3	GT	2	1
85	Cimmerian	32	C	8,580	18.8	30	43	2	RB GT CT H	1 1 1 1	1 1 1 1
86	Lake Surrender	32	C	8,625	9.1	40	59	2	RB GT CT H	1 1 1 1	1  1 1
87	Raven	40	C	8,750	10.0	46	47	2	RB GT CT H	1 1 1 1	1 1 1 1

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88	Dreary	40	C	9,040	15.5	12	100	3	H <sub>1</sub>	1	1
89	Trouble	40	C	9,325	8.9	12	100	3	B		1
90	Clam	40	C	9,940	7.8	40	53	3	B		1
91	Lake Pinchot	40	C	9,260	53.9	30	51	3	H <sub>1</sub>	1	1
92	Unnamed	40	C	9,840	2.7	4	100	3	B		3
93	Jay	40	C	9,600	23.7	48	19	4	CT	2	1
94	Chalice	40	C	9,590	12.4	34	50	4	B		1
95	Lone Ranger	32	C	9,030	4.4	15	100	3	B		3
MOUNTAIN CREEK											
96	Mtn View (Mouat)	32	C	6,750	4.0	13	100	1	WS CH	1 1	4
HORSEMAN FLATS CREEK											
97a	No Ketchum	32	C	5,466	1.9	47	27	1	WS ES RB	1 1 2	1 1 2
97b	Zoeteman	32	P	5,025	2.1	22	55	1	ES		
SADERBALM CREEK											
98	Saderbalm	32	C	8,980	7.4	29	70	3	B		6
98a	Saderbalm Ponds (2)	32	C	8,530	5.4t	3	100	2	B		3
99	Saderbalm Lakes (3)	32	C	9,680	8.9t	7	100	3	B		3

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TUMBLE CREEK											
100	Jasper (Tumble)	32	C	9,080	53.2	77	40	3	CT	1	6
100a	Little Tumble	40	C	9,180	8.9	8	100	3	B		6
101	Unnamed	32	C	9,700	25.4	17	72	4	B		3
LIGHTNING CREEK											
102	Lightning	40	C	9,340	61.3	122	37	3	GT	1	1
102a	Little Lightning	40	C	9,280	6.9	12	100	2	GT	1	1
102b	Okeepanokee	40	C	9,380	2.4	10	100	2	B		3
102c	Unnamed	40	C	9,360	1.3	6	100	2	B		3
102d	Unnamed	40	C	9,150	2.2	8	100	2	B		3
DIVIDE CREEK											
103	Divide Creek	40	C	8,925	3.4	3	100	2	B		3
PICKET PIN CREEK											
104	South Picket Pin	40	C	9,025	5.0	19	98	2	CT		2
105	North Picket Pin	40	C	8,825	5.3	24	60	2	CT		2
CASTLE CREEK											
106	Castle Creek	40	C	7,680	.7	2	100	1	B		3
WEST FORK STILLWATER											
107	Unnamed Pont	32	P	6,113	1.2	2	100	1	B		3





- <sup>1</sup> See Figure 1 for locations.
- <sup>2</sup> 49 = Park County; 40 = Sweetgrass; 32 = Stillwater.
- <sup>3</sup> C = Custer National Forest; P = Private.
- <sup>4</sup> 1 = Transition; 2 = Canadian; 3 = Sub-alpine; 4 = Alpine.
- <sup>5</sup> RB = Rainbow trout; CT = Cutthroat trout; EB = Brook trout; GT = Golden trout; H<sub>1</sub> = RBxGT (rainbow x golden); H<sub>2</sub> = CTxGT (cutthroat x golden); H = RBxCTxGT (rainbow x cutthroat x golden); WS = White sucker; ES = Emerald shiner; CH = Unidentified Chub; B = Barren of fish.
- <sup>6</sup> 1 = Self-sustaining; 2 = Stocked at intervals.
- <sup>7</sup> 1 = No immediate management necessary; 2 = Stocked; 3 = No fisheries potential;  
4 = Rehabilitate and stock new species; 5 = Stock new species after present fisheries die out;  
6 = Stock to establish self-sustaining population; 7 = Inhabit from upstream source.

### Accessibility

A vehicle can be used to get reasonably close to 10 lakes of the 154 lakes in the drainage. Another 41 lakes are accessible by horse travel and the remaining 103 are reached by foot travel only.

Both the main Stillwater River and West Fork drainages are accessible by maintained trails. Other trails branch off these paths to areas on Lake Plateau and Lake of the Woods. Trails lead to 32 lakes; numerous others are reasonably close. However, 122 lakes have no trails.

### Water chemistry

Chemical attributes of 41 lakes (Table 2) had a mean hydrogen ion concentration of 6.4. Conductivities in the high country were 8 to 29 mhos. Chrome, Mountain View, No Ketchum and the Picket Pin lakes had considerably higher conductivities and other values. Phosphate measurements were typically higher in this drainage than in others in the Absaroka-Beartooth Study Area.

### Thermal

Surface temperatures from mid-July to September 9, 1978 ranged from 45 to 56° F. at lakes greater than 9,000 feet in altitude. The coldest waters were found in the shaded lakes from Hodges Mountain to Fox Peak. Ice cover prevails over ice-free days. The average open water period is approximately 138 days.

### Water clarity

As with most mountain areas of similar elevation and latitude, little turbidity accompanies spring runoff or turbulent rainstorms. Most of the other drainages in the Absaroka-Beartooth Study Area have considerably more green lakes than typical of the Stillwater River drainage. Lakes with the lowest limits of turbidity were those in the upper Glacier Creek, and some of the lowland pond-type environments like No Ketchum.

### Plankton

Samples of zooplankton are far from adequate to describe the drainage (Table 3). Of the 43 lakes sampled, large zooplankton were common to 9 (21%) lakes. These important fish foods occupy 40% of all the lakes in the Absaroka-Beartooth Study Area. Their occurrence in the Stillwater River drainage is considerably less than the other drainages which range from 22 to 88%.

Table 2. Chemical attributes of lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of Lake	pH	Conductivity (mhos)	Alkalinity (ppm)	Total hardness (ppm)	Silica (ppm)	Iron (ppm)	Total phosphate (P) t = trace (no units)
1	Chrome	7.0	140	525	110	2.5	.11	.63
2	Lake Wilderness	6.8	18	35	10	1.1	0	.04
3	Wood	6.6	17	45	20	1.4	.02	.11
7	Sioux Charley	6.3		50	15	1.1	.20	.15
18	Incisor	6.9	26	40	28	2.7	.10	.18
19	Cavity	6.7	11	35	30	1.2	.03	.09
20	Wrong	6.8	11	20	10	1.0	.15	
21	Courthouse	6.5	8	17	5	.6	.05	.01
24	Sourdough	6.3	10	12	7	1.1	.02	
25	Fly	6.3	9	45	2	1.2	.13	
26	Spider	6.3	9	45	2	1.2	.13	.02
34	Beauty	6.5	10	15	4	1.6	.09	.02
36	Anvil	6.3	10	14	7	1.3	.09	.20
40	Wall	7.0	10	24	7	1.0	.15	.02
42	Goose	6.6	19	40	28	2.3	.05	.15
45	Unnamed	7.1	16	30	10	.8	.04	.13
46	Huckleberry	6.8	10	10	5	1.1	.06	.12
47	Mutt	6.3	20	10	8	1.1	.07	
48	Jeff	6.3	20	10	8	1.1	.07	

Table 2. Chemical attributes of lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of Lake	pH	Conductivity (mhos)	Alkalinity (ppm)	Total hardness (ppm)	Silica (ppm)	Iron (ppm)	Total phosphate (P) t = trace (no units)
49	Lake of the Woods	6.3	29	15	15	2.2	.05	.30
54	Aufwuchs	6.2	14	35	10	.7	.12	.19
55	Mouse	6.1	10	5	6	.6	.02	.12
56	Favonius	6.0	11	12	10	1.1	.05	.36
59	Pentad	6.0	11	12	10	1.1	.05	.36
61	Sundown	6.0	13	28	5	1.6	.05	.02
62	Jordan	6.1	10	10	9	1.4	.01	.40
63	Cirque	6.1	18	38	2	1.6	.01	.30
65	Martes	6.0	18	38	10	.9	.02	.32
70	Pipit	6.1	7	40	7	1.4	.06	.05
72	Wounded Man	6.2	18	7	7	1.1	.35	.09
73	Diaphanous	6.0	8	20	10	1.1	.08	.06
87	Raven	6.3	13	12	5	1.4	.15	.13
93	Jay	6.3	11	0	7	.8	.28	.10
96	Mountain View	6.6	115	70	55	8.4	.11	.28
97a	No Ketchum	6.1	342	450	175	3.6	.02	.48
97b	Zortman	7.4	270	185	170	2.6	.08	1.40
100	Jasper	6.1	10	10	10	2.3	.08	0
102	Lightning	6.8	12	30	7	3.1	.10	.25

Table 2. Chemical attributes of lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of Lake	pH	Conductivity (mhos)	Alkalinity (ppm)	Total hardness (ppm)	Silica (ppm)	Iron (ppm)	Total phosphate (P) t = trace (no units)
102a	Little Lightning	6.8	12	50	3	3.5	0	.69
104	South Picket Pin	6.2	35	40	22	4.3	.03	.22
105	North Picket Pin	6.0	29	60	15	2.2	.05	.18

<sup>1</sup> See Figure 1 for locations.

Table 3. Plankton samples from lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of lake	Sample date	Volume of plankton cc/m <sup>3</sup>	Number/m <sup>3</sup> of zooplankton	Number/m <sup>3</sup> of large zooplankton	Species of large zooplankton
1	Chrome	09/08/78	1.44	57		
2	Lake Wilderness	09/08/78	0	0		
3	Wood	09/08/78	1.28	51		
7	Sioux Charley	08/23/79	.05	0		
13	Imelda	09/03/75	.40	0		
18	Incisor	09/05/78	1.67	24	24	<u>D. shoshone</u>
19	Cavity	09/05/78	0	0		
20	Wrong	09/02/75	.40	115	115	<u>D. shoshone</u>
		08/26/78	1.63	98	98	<u>D. shoshone</u>
		09/05/79	.46	880	23	<u>D. shoshone</u>
21	Courthouse	09/02/76	3.00	4,171	86	<u>D. shoshone</u>
		08/26/78	3.59	180	108	<u>D. shoshone</u>
		09/05/79	4.30	775	345	<u>D. shoshone</u>
24	Sourdough	08/25/78	0	0		
		09/05/79	2.24	157		
25	Fly	09/05/79	2.13	372		
26	Spider	08/26/78	5.52	304		
34	Beauty	08/25/78	0	0		
36	Anvil	09/02/76	1.70	1,709	428	<u>D. shoshone</u>
		08/25/78	4.78	96		
		09/04/79	.86	603		

Table 3. Plankton samples from lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of lake	Sample date	Volume of plankton cc/m <sup>3</sup>	Number/m <sup>3</sup> of zooplankton	Number/m <sup>3</sup> of large zooplankton	Species of large zooplankton
40	Wall	08/26/78	1.12	292	22	<u>D. shoshone</u>
42	Goose	09/05/78	1.28	22		
45	Unnamed	08/15/78	4.30	3,159		
46	Huckleberry	08/15/78	.57	86		
47	Mutt	09/04/79	2.87	86		
48	Jeff	09/04/79	.60	0		
49	Lake of the Woods	09/08/77	4.10	2,975	2,934	<u>D. pulex</u>
54	Aufwuchs	08/21/79	.04	36		
55	Mouse	08/23/79	3.8	180		
56	Favonius	08/23/79	.36	0		
59	Pentad	08/23/79	.08	0		
61	Sundown	08/23/79	.05	72		
62	Jordan	08/23/79	.04	36		
63	Cirque	08/23/79	.72	24		
64	Sunken Rock	08/23/79	.07	0		
65	Martes	08/23/79	.04	0		
66	Barrier	08/23/79	.04	0		
72	Wounded Man	08/23/79	.12	48		

Table 3. Plankton samples from lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of lake	Sample date	Volume of plankton cc/m <sup>3</sup>	Number/m <sup>3</sup> of zooplankton	Number/m <sup>3</sup> of large zooplankton	Species of large zooplankton
73	Diaphanous	08/23/79	2.15	646	96	<u>D. shoshone</u>
					24	<u>D. middendorffiana</u>
87	Raven	09/11/73	1.70	214		
		08/24/79	1.00	132		
93	Jay	08/24/79	.36	203	12	<u>D. shoshone</u>
96	Mountain View	08/10/76	.36	0		
97a	No Ketchum	07/06/78	.84	5,720		
		08/28/79	1.53	2,000		
97b	Zoeteman	08/29/79	10.77	1,292		
100	Jasper	08/01/78	.47	75		
102	Lightning	07/30/73	5.30	12		
		08/12/73	.60	263		
		08/14/73	1.25	2,547		
		09/11/73	2.25	2,549		
		09/12/73	2.15	3,828		
		09/28/73	.70	189		
		07/16/75	.60	109		
		07/24/75	1.60	162		
		07/29/75	.40	149		
		09/01/75	7.20	0		
		03/15/76	.72	180		
		08/02/75	1.20	311		



Table 3. Plankton samples from lakes in the Stillwater River Drainage of the Beartooth Mountain Range

Location code <sup>1</sup>	Name of lake	Sample date	Volume of plankton cc/m <sup>3</sup>	Number/m <sup>3</sup> of zooplankton	Number/m <sup>3</sup> of large zooplankton	Species of large zooplankton
102a	Little Lightning	07/28/73	1.50	1,167		
		09/10/73	.40	72		
		09/27/73	.90	0		
		07/15/75	.70	251		
		07/24/75	1.40	215		
		07/29/75	.70	180		
		08/12/75	1.40	1,077		
		09/11/75	1.10	144		
		03/15/76	12.0	1,199		
102b	Okeepanokee	09/29/73	1.40	629	629	<u>D. shoshone</u>
104	South Picket Pin	08/10/76	1.08	323		

<sup>1</sup> See Figure 1 for locations.

## Fisheries

Thirty-seven percent (57) of the 154 lakes in the drainage have trout populations. The distribution of fisheries in the lakes of the drainage is:

<u>Number of lakes</u>	<u>Type of fishery</u>
8	Brook Trout
24	Cutthroat Trout
2	Rainbow Trout
6	Golden Trout
17	Mixed species
2	Rough fish
<u>95</u>	<u>Barren of fish</u>
154	Total lakes
38%	With fish
37%	With trout

The rough fish are found in Mountain View, Horseman Flats and Zoeteman lakes, none of which are truly mountain lakes. Mixed species refers to lakes having two separate species, i.e. Sioux Charley Lake (Brook and Rainbow Trout) or those having hybrid forms (7 lakes) of either Rainbow x Cutthroat ( $H_2$  in Table 1), Rainbow x Golden ( $H_1$  in Table 1) or combinations of Rainbow, Golden and Cutthroat trout typical of five lakes.

Rainbow Trout in Wounded Man and Diaptomus, eight lakes with Brook Trout (mostly near Cooke City), and eight Cutthroat Trout populations are self-sustaining fisheries. The remaining 16 lakes are periodically stocked with Cutthroat Trout (Table 4). Table 5 gives the latest fisheries information and sampling dates for lakes located within the Stillwater River drainage.

The largest group of lakes (95) are those without fish. Sixteen of these 95 were recognized as having some fisheries potential.

The origins of most populations of fish in the drainage have been searched out and are accountable. Those populations whose origin are yet unexplainable include Lake of the Woods and Goose Lake. Both of these lakes have Cutthroat Trout with characteristics identified as pure Yellowstone (Wallace & Behnky pers. comm.). The most realistic explanation of their origin was derived from numerous interviews with pioneers. The majority interviewed felt that both lakes were stocked by prospectors and that fish were transplanted from either Slough Creek, the Stillwater River, or the Lamar River. Vern Waples, retired game warden, reported that Bud Hart occupied a cabin at the outlet of Goose Lake from 1906-1907. Mr. Hart apparently hauled cutthroat trout from the Clarks Fork of the Yellowstone River in lard pails to Goose Lake during his stay at the lake.

Table 4. Fish planted by the State of Montana in lakes in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Number of fish	Species and strain <sup>2</sup>	Number/acre	Date planted
1	Chrome	200	GR	55	08/15/85
		3,570	RB	991	06/14/49
		8,000	EB	2,222	08/12/43
		15,000	CT'Y	4,166	09/13/32
2	Lake Wilderness	3,000	CT'M	158	08/18/84
		540	CT'M	28	08/10/76
3	Wood	1,800	CT'M	151	08/07/89
		1,800	CT'M	151	08/05/81
		1,200	CT'M	100	08/10/76
7	Sioux Charley	2,750-29,460	RB	763-8,183	1948-1951
		5,000-40,000	CT'Y	1,388-11,111	1937-1947
		5,000	RB	1,388	1940
		10,000-50,000	RB	2,777-13,888	1933-1936
		50,000	CT'Y	13,888	1931
8	Cataract	1,000	CT'M	103	08/17/77
17	Glacier Creek	6,900	CT'Y	423	09/20/37
18	Incisor	1,500	GT	254	09/15/84
20	Wrong	3,106	CT'M	150	07/22/85
		3,100	CT'M	150	08/16/79
		2,500	CT'Y	121	08/27/70
21	Courthouse	1,755	CT'M	93	08/13/87
		1,185	CT'M	63	08/16/79
		4,536	CT'Y	241	07/30/71

Table 4. Fish planted by the State of Montana in lakes in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Number of fish	Species and strain <sup>2</sup>	Number/acre	Date planted
24	Sourdough	1,000	CT'Y	384	07/26/67
26	Spider	1,000	CT'Y	158	08/27/70
34	Beauty	2,080	CT'Y	352	07/23/68
		1,000	CT'Y	169	07/26/67
36	Anvil	981	CT'M	97	07/25/85
		1,000	CT'M	99	08/17/77
		2,080	CT'Y	205	07/23/68
		1,000	CT'Y	99	07/26/67
46	Huckleberry	3,570	CT'Y	245	06/14/49
54	Aufwuchs	7,020	CT'Y	234	08/01/69
55	Mouse	690	CT'M	100	08/14/84
		582	CT'Y	84	08/25/70
61	Sundown	510	CT'M	98	08/13/87
		528	CT'M	101	08/16/79
64	Sunken Rock	2,500	GT	225	09/15/84
		4,050	CT'Y	364	08/01/69
65	Martes	1,755	CT'M	100	08/13/87
		1,749	CT'M	100	08/16/79
		3,060	CT'Y	174	08/01/69
72	Wounded Man	19,890	CT'Y	396	08/22/46
		6,590	CT'Y	131	09/27/38
		33,600	CT'Y	669	08/02/38

Table 4. Fish planted by the State of Montana in lakes in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Number of fish	Species and strain <sup>2</sup>	Number/acre	Date planted
73	Diaphanous	1,608	RB	174	08/07/80
80	Asteroid	1,920	GT	600	07/27/82
84	Dryad	1,440	GT	282	07/27/82
91	Pinchot	12,000	GT	223	1939
93	Jay	2,300	CT'M	97	08/17/77
96	Mountain View (Mouat)	7,000 4,000	RB CT'Y	1,750 1,000	07/26/43 09/29/37
97a	No Ketchum	910 624 900 907	RB RB RB RB	478 328 473 477	07/07/57 06/24/56 05/20/56 07/10/55
97b	Zoeteman	1,068 1,075	RB RB	508 512	10/09/58 10/01/55
98	Saderbalm	500	GR	9	08/05/85
100	Jasper (Tumble)	5,000 5,074	CT'M CT'Y	93 95	08/17/77 08/01/68
102	Lightning	10,310	GT	168	09/26/56
104	South Picket Pin	500 491 1,092	CT'M CT'M CT'Y	100 98 218	08/07/89 07/22/85 07/26/71

Table 4. Fish planted by the State of Montana in lakes in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Number of fish	Species and strain <sup>2</sup>	Number/acre	Date planted
105	North Picket Pin	510	CT'M	96	08/13/87
		541	CT'M	102	08/02/83
		529	CT'M	99	08/05/81
		545	CT'M	102	08/16/79
		1,040	CT'Y	196	07/16/69

<sup>1</sup> See Figure 1 for locations.

<sup>2</sup> RB = Rainbow trout; GT = Golden trout; GR = Arctic grayling; CT'Y = Yellowstone cutthroat trout; CT'M = McBride cutthroat trout.

Table 5. Fisheries distribution, average length, population status and latest survey date for lakes located in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Fish species <sup>2</sup>	Average catch/net	Average length	Sustaining population	Stocked population	Survey date
2	Lake Wilderness	CT	17	13.9	X		08/16/88
3	Wood	CT	3	13.1		X	08/16/88
7	Sioux Charley	EB RB CT	32	8.4	X X X		07/18/74
8	Cataract	CT			X		08/08/90
13	Imelda	EB	35	8.4	X		09/03/75
17	Glacier Creek	EB	21	8.5	X		09/05/74
18	Incisor	GT	10	13.6	X		07/26/90
20	Wrong	CT	4	10.0		X	08/23/89
21	Courthouse	CT	10	13.3		X	07/27/90
24	Sourdough	EB	42	8.4	X		08/23/89
25	Fly	EB	23	9.7	X		08/23/89
26	Spider	EB	36	8.6	X		08/23/89
29	Lake Aries	EB	56	8.3	X		08/22/89
34	Beauty	CT	8	9.6	X		08/22/89
36	Anvil	CT	8	12.4		X	08/22/89

Table 5. Fisheries distribution, average length, population status and latest survey date for lakes located in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Fish species <sup>2</sup>	Average catch/net	Average length	Sustaining population	Stocked population	Survey date
42	Goose	CT	18	8.2	X		08/16/89
43	Little Goose	CT	22	10.4	X		07/26/90
46	Huckleberry	EB	18	7.5	X		07/29/69
49	Lake of the Woods	CT	54	8.5	X		09/14/72
54	Aufwuchs	CT	2	14.3	Status uncertain		08/22/79
55	Mouse	CT	9	11.2		X	08/23/79
56	Favonius	CTxGT (CT)	2	12.0	X		07/24/85
59	Pentad	CTxGT (CT)	12	10.4	X		07/24/85
61	Sundown	CT	3	13.7		X	07/23/85
62	Jordan	CT	5	10.8	X		08/12/86
64	Sunken Rock	GT	0		Status uncertain		08/09/90
		CT	2	18.3		X	07/26/78
65	Martes	CT	6	12.7		X	07/24/85
66	Barrier	GTxRB	2	11.5	X		08/12/86
69	Unnamed	RB	4	8.4	X		08/23/83



Table 5. Fisheries distribution, average length, population status and latest survey date for lakes located in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Fish species <sup>2</sup>	Average catch/net	Average length	Sustaining population	Stocked population	Survey date
70	Pipit	CTxRB CTxRB	5 3 Hook & Line	12.1 11.0	X		07/27/78 (1983)
71	Owl	CTxRB	11	10.1	X		07/26/78
72	Wounded Man	RB	3	9.0	X		08/12/86
73	Diaphanous	RB	5	10.7	X		08/23/83
76	Bill	CTxGT GTxRB	7 16	10.5 11.0	X		07/22/71
85	Cimmerian	RB GTxRB	2 4	14.7 10.5	X		08/14/86
86	Lake Surrender	CTxRB GTxRB RB	1 6 2	16.7 10.7 11.4	X		07/23/71
87	Raven	GTxRB CTxGT GT	10 15 7	9.5 10.8 8.9	X		09/12/83
88	Dreary	GTxRB	24	8.8	X		08/13/86
91	Lake Pinchot	GTxRB	13	9.5	X		07/26/69
93	Jay	CT	1	14.0	X		08/14/86
96	Mountain View	EB WSU	3 31	7.1 8.1	X		08/09/89

Table 5. Fisheries distribution, average length, population status and latest survey date for lakes located in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Fish species <sup>2</sup>	Average catch/net	Average length	Sustaining population	Stocked population	Survey date
100	Jasper	CT	8	14.1	X		08/12/74
102	Lightning	GT	8	12.0	X		08/02/78
103	Little Lightning	GT	82	8.5	X		08/01/78
104	South Picket Pin	CT	11	13.4		X	09/08/81
105	North Picket Pin	CT	13	14.5		X	09/22/89

<sup>1</sup> See Figure 1 for locations.

<sup>2</sup> RB = Rainbow trout; CT = Cutthroat trout; EB = Brook trout; GT = Golden trout; GR = Arctic grayling.

Another group of lakes with unexplained fisheries include most of those on Lake Plateau. Three species, Rainbow, Golden, and Cutthroat Trout, have readily mixed in these lakes. All three species were most likely stocked by the State of Montana; however, records were not compiled or were misplaced. A plant of 12,000 Golden Trout was placed in Lake Pinchot in 1939, which accounts for Golden Trout characteristics in fish throughout Flood Creek. Golden Trout blood in trout from Barrier Lake probably was the result of a transplant of goldens from Lake Pinchot.

Rainbow Trout were also dispersed by the Department of Fish and Game in the 1930's when airplanes were first utilized as a stocking tool. No records were found; however, both Pinchot and Wounded Man were felt to have been stocked by this means. Other waters could have been stocked by transplants from lake to lake.

Cutthroat were introduced in recent times, and were also assumed to come from aerial plants by the Department of Fish, Wildlife and Parks. Characteristics of this fish appear among fish in Pentad, Flavonius, Unnamed #60, and in Flood Creek lakes.

Plants by the State of Montana (Table 5) include Cutthroat and Golden Trout in the high country lakes and Rainbow Trout in No Ketchum, which is accessible by car. Brook Trout found in Glacier Lake #17, Imelda Lake #13, Sourdough Basin Lakes (Figure 2), Huckleberry #46, Mutt #47 and Jeff #48, were transplants by Tommy Garrison from brook trout waters near Cooke City.

During 1988 and 1989 (Poore & Frazer 1990), a voluntary trailhead creel information survey was implemented at the major access points to the Absaroka-Beartooth Wilderness Area (A-B). That study showed, in spite of liberal fish limits for the A-B mountains, anglers kept only 26% of their catch in 1988 and 27% in 1989. Anglers release three out of four fish they presently catch without being required to by restrictive regulations. By a four to one majority, those fishermen responding to the survey wanted to see the present liberal fish limits retained in the A-B.

A-B anglers kept 35% of the Brook Trout they caught, 24% of the Rainbows and 22% of Cutthroat. The average catch per hour for each fish species was; 0.94 for Cutthroat Trout, 0.72 for Rainbow Trout, and 1.27 for Brook Trout. Catch rates for 1988 and 1989 were identical with 2.6 fish per hour on lakes, 4.3 fish per hour on streams, and 2.4 fish per hour for people fishing both lakes and streams.

#### MANAGEMENT RECOMMENDATIONS FOR LAKES IN THE STILLWATER RIVER DRAINAGE

The basic "management fish" for the drainage is the McBride Cutthroat Trout, raised at the Yellowstone River Trout Hatchery in Big Timber, Montana. All fish plants (Table 6) recommended in the 1980 Stillwater Management Plan were made as scheduled. Ten lakes are proposed for periodic plants of Cutthroat Trout. Additional Cutthroat plants include 1,015 fish in 1991, 690 in 1992, 3,560 in 1993, 4,150 in 1995 and 1,200 in 1997. Plants of Cutthroat Trout are recommended to be discontinued in Lake Wilderness and Jasper Lake, because both now have self-sustaining fisheries. The plant in Aufwuchs Lake is to be discontinued because of the difficult

Table 6. Fish stocking proposed for lakes in the Stillwater River Drainage of the Beartooth Mountain Range.

Location code <sup>1</sup>	Name of lake	Next stocking year	Stocking frequency <sup>2</sup>	Fish species <sup>3</sup>	Number of fish	Number of fish/acre
3	Wood	1997	8	CTM	1,200	100
8	Cataract	1991	8	CTM	485	50
20	Wrong	1993	8	CTM	2,060	100
21	Courthouse	1995	8	CTM	1,880	100
36	Anvil	1993	8	CTM	1,000	100
55	Mouse	1992	8	CTM	690	100
61	Sundown	1995	8	CTM	520	100
64	Sunken Rock	1991	0	GT	1,100	100
65	Martes	1995	8	CTM	1,750	100
80	Asteroid	1991	0	GT	320	100
84	Dryad	1991	0	GT	510	100
98	Saderbalm	When Available	0	GR	740	100
104	South Picket Pin	1993	4	CTM	500	100
105	North Picket Pin	1991	4	CTM	530	100

<sup>1</sup> See Figure 1 for locations.

<sup>2</sup> 0 = Plant on one time basis; other numbers signify repetition in years.

<sup>3</sup> GT = Golden trout; GR = Arctic grayling; CTM = McBride cutthroat trout; EB = Brook trout; RB = Rainbow trout.

access and some evidence of natural reproduction. Aufwuchs Lake needs to be surveyed to better determine the status of the fishery.

Another new plant involves Rainbow Trout in Lake Diaphanous (#73). This species was chosen because of the predominance of Rainbow Trout in Wounded Man Lake downstream. A survey made in 1983 indicated the lake probably has a self-sustaining rainbow population and should not require additional stocking.

Sadderholm Lake (#98) is proposed for an Arctic Grayling plan due to its fishless state and its potential to harbor a self-sustaining fishery (Marcuson 1974). Three lakes were chosen for Golden Trout because of their potential characteristics for this species (Marcuson 1976). Ranking these Golden Trout waters from best to worst are Flood Creek Lakes (#80, 84, Figure 3), Sunken Rock (#64) and Incisor (#18, Figure 4) lakes. Goldens were planted into Flood Creek Lakes #80 and #84 during 1982, but the success of the introduction has not been evaluated. These two lakes should be surveyed prior to additional plants scheduled for 1991. Sunken Rock and Incisor lakes were stocked with Golden Trout in 1984. During surveys in 1990, no goldens were found in Sunken Rock, but what appeared to be a self-sustaining population was noted in Incisor Lake. Sunken Rock is scheduled for another plant of Golden Trout in 1991. Incisor should be surveyed again in 3 or 4 years.

Management recommendations for the 95 fishless lakes in the drainage are as follows: Those with no fisheries potential (77) and those with potential but without management recommendations (16) will remain fishless. Twelve barren lakes are proposed for management.

Sundown Lake is the only lake scheduled for stoking on a regular basis that has never been stocked before. The two Picket Pin lakes are also scheduled for periodic plants; both have been previously stocked. These lakes are designated as B-2 in Table 1's fish species and management columns.

Four lakes are scheduled for Grayling and/or Golden Trout. These are B-6 in Table 1, i.e. lakes where fishery should become self-sustaining. The four B-7 lakes in Table 1 are those waters that will contain some fish as a result of stocking one of the above lakes. These include numbers 18B & C and Comet #79 and Needle #78 lakes.

Realization of this plan would produce a distribution of fish as follows:

<u>Numbers of lakes</u>	<u>Type of fishery</u>
8	Brook Trout
24	Cutthroat Trout
2	Rainbow Trout
8	Golden Trout
16	Mixed species
1	Arctic Grayling
3	Rough fish
<u>92</u>	<u>Barren of fish</u>
154	Total lakes
40%	With fish
38%	With trout

When compared to the listing on page ?, trout would occur in 12 additional waters not previously providing recreation. One lake previously planted, Aufwuchs, plus 16 barren waters have excellent fisheries potential and are recommended to be left in a fishless status typical of wilderness (Marcuson 1976). In all, the drainage will have 60% of the lakes without fisheries.

Implementation of more restrictive regulations throughout the entire A-B Wilderness at this time is not warranted because: 1) Use is restricted by difficult access and the large number of lakes containing fisheries. Maintained trails lead to less than half the lakes with fish. 2) Many A-B lakes need more harvest because they contain overabundant populations of Brook Trout and (in some lakes) Yellowstone Cutthroat. 3) Unlike most wilderness lakes many A-B lakes are uniquely fertile and productive. Even with liberal limits, optimum harvest has not been reached. 4) Our trailhead creel survey indicates people are regulating their own harvest and prefer this to being required to follow unnecessarily stringent regulations.

Several areas along major trails (especially where horses are allowed) are showing signs of overuse and may require some type of special management. Most A-B wilderness users, however, are satisfied with present management and the resource is in excellent shape.

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# LIST OF LAKES WITH MORE THAN ONE NAME

<u>Lake Code Number</u>	<u>Lake Name</u>	<u>2nd Lake Name</u>
73	Lake Diaphanous	Diaptomus
76	Bill	Flood Creek #1
77	Mimi	Flood Creek #2
78	Needle	Flood Creek #7
79	Comet	Flood Creek #3
83	Lake Pisces	Lake Pisce
96	Mountain View	Mouat
98	Sodderholm	Sadderbalm
100	Jasper	Tumble